

## REMARKS

This application has been reviewed in light of the Advisory Action dated January 23, 2007. In view of the foregoing amendments and the following remarks, favorable reconsideration is respectfully requested.

Claims 10-22 are pending. Claims 10, 18, 21 and 22 have been amended. Support for the claim changes can be found in the original disclosure, and therefore no new matter has been added. Claims 10, 18, 21 and 22 are in independent form.

In the final Office Action dated September 22, 2006, Claims 10-16 and 18-22 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,493,109 (*Takamura et al.*), and Claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Takamura et al.* in view of U.S. Patent No. 5,539,433 (*Kawai et al.*).

Without conceding the propriety of the rejections, independent Claims 10, 18, 21 and 22 have been amended. Applicant submits that, for at least the reasons set forth below, independent Claims 10, 18, 21 and 22 are allowable over the art cited in the Office Action.

Independent Claim 10 is directed to an inkjet print head substrate on which is provided a print head assembly. The print head assembly includes, *inter alia*, an ink supply opening, an array of printing elements provided along the ink supply opening, an array of driving circuits provided along the ink supply opening, and a plurality of shift registers provided at both longitudinal ends of the ink supply opening. Each of independent Claims 18, 21 and 22 (directed to an inkjet print head, an inkjet print head cartridge, and a printing apparatus, respectively) include, *inter alia*, the same or similar recitations.

Applicant submits that, for at least the reasons set forth below, the art cited in the September 22, 2006 final Office Action does not teach or suggest at least these recitations of Applicant's independent claims.

The amendments to the independent claims clarify that the print head substrate and print head are an inkjet print head substrate and inkjet print head, respectively, and that an ink supply opening is included in the print head assembly provided on the print head substrate (of the print head).

In the context of Applicant's claimed invention, it is understood that where a print head assembly includes an ink supply opening, the degrees of freedom of the circuit layout on the assembly are restricted. For example, in a print head assembly in which an ink supply opening is provided and an array of printing elements is provided along the ink supply opening, the array can be quite lengthy. Therefore, data supply means, e.g., a plurality of shift registers, may be provided at both longitudinal ends of the ink supply opening so as to reduce the length and extent of winding of the wiring used for transferring print signals. In addition, a selection circuit may be provided in common to a plurality of groups of printing elements of the array since the selection may need to be made from a spatially wide-ranging plurality of printing elements.

*Takamura et al.* relates to a print head driving apparatus and printer using the same. The apparatus includes a printing data number control circuit, a shift register, a latch circuit and a driving waveform selecting circuit. However, *Takamura et al.* does not teach or suggest a print head assembly (of a print head substrate), having a plurality of printing elements, which includes an ink supply opening, or anything pertaining thereto. So too, *a fortiori*, *Takamura et al.* does not teach or suggest any arrangements in which print

elements, driving circuits or shift registers are physically disposed in a particular spatial relationship to an ink supply opening of a print head assembly of a print head substrate.

In what follows, Applicant responds to the Examiner's replies (set forth in the January 23, 2007 Advisory Action) to Applicant's arguments set forth in the Response After Final Rejection filed on December 22, 2006.

*The Examiner's replies to Applicant's arguments in Section A*

Regarding Applicant's arguments in Section A of the Response, the Examiner replies that col. 8, lines 33-44 of *Takamura et al.* inherently teach an ink supply opening of a print head substrate. In this regard, the Examiner cites *Takamura et al.*'s "output pins DO1 to DOn outputting drive waveforms for driving a print head ... in which n output devices (such as ... a heat emitting device and ink containers for an inkjet head) ..." (*Takamura et al.*, col. 8, lines 33-37). The Examiner states "Without an ink supply opening for said ink containers, said ink containers can do nothing with respect to the printing of the image data."

Thus, according to Applicant's understanding, the Examiner is asserting that *Takamura et al.*'s teaching of output pins along with ink containers for an inkjet head suggests or inherently teaches an ink supply opening in an inkjet head substrate because, absent an ink supply opening in the inkjet head substrate, the ink containers would serve no purpose with respect to printing, and it would not be possible for the inkjet head to print without an ink supply opening in the inkjet head substrate. (On this point see also the Examiner's reply to Applicant's arguments in Section C ("without a corresponding ink supply opening, there would be no ink to be output by the output devices").) Applicant respectfully disagrees with these conclusions apparently drawn by the Examiner.

Specifically, Applicant submits that it is possible for an inkjet head to print without there being an ink supply opening on the print head substrate having the print elements. Such possibility could be realized, e.g., if ink is supplied from one end of the print head substrate. Moreover, there is no basis for assuming that *Takamura et al.* would employ, or implies, not merely an ink supply opening on the print head substrate, but more specifically an ink supply opening provided in a print head assembly of a print head substrate. Even if an ink supply opening were provided on the print head substrate, the print head could nonetheless function using an arrangement in which the ink supply opening is not provided in the print head assembly of the print head substrate. As there are various arrangements for supplying ink to printing elements, nothing in *Takamura et al.* is understood to suggest, nor has anything therein been cited by the Examiner that would suggest, an arrangement in which an ink supply opening is provided in a print head assembly of a print head substrate.

*The Examiner's replies to Applicant's arguments in Section B*

Regarding Applicant's arguments in Section B of the Response, the Examiner replies, citing the same portion of *Takamura et al.*, that *Takamura et al.*'s output pins are used to drive an array of printing elements provided along an ink supply opening of a print head substrate, as evidenced by the fact that the  $n$  output pins drive  $n$  output devices, the output devices being, e.g., a heat emitting device and an ink container.

However, Applicant submits that the fact that *Takamura et al.* teaches that  $n$  output pins drive  $n$  output devices does not teach or suggest that  $n$  output pins drive an array of printing elements provided along an ink supply opening of a print head substrate.

The Examiner states further "considering the whole of what is taught in column 8, lines 33-44 of *Takamura*, it is clear that an array of printing elements (each

output device corresponding to each particular output pin) are provided along an ink supply opening of a print head substrate (each ink supply opening for each ink container used to supply the ink jet head).

In this regard, the Examiner is understood to cite *Takamura et al.*'s output pins as corresponding to Applicant's claimed printing elements, and *Takamura et al.*'s allegedly inherent ink supply openings (corresponding respectively to *Takamura et al.*'s ink containers) as corresponding to Applicant's claimed ink supply opening. On this interpretation, Applicant understands that *Takamura et al.* is alleged to teach an array of printing elements located in correspondence to an array of corresponding ink supply openings. (On this point see also the Examiner's reply to Applicant's arguments in Section C ("there is a corresponding ink supply opening for each output pin ... in ... Takamura").) However, Applicant's independent claims recite an array of printing elements along an ink supply opening, not an array of printing elements arranged in correspondence with a plurality of corresponding ink supply openings.

Further in this regard, Applicant notes the Examiner's reference to "the whole of what is taught in column 8, lines 33-44 of Takamura." In that regard, Applicant notes M.P.E.P. 2131, which states:

TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.

...

The identical invention must be shown in as complete detail as is contained in the ... claim.

Applicant submits that (at least) the recited provision of the array of printing elements along an ink supply opening has not been shown in the manner required by M.P.E.P. 2131 for an anticipation rejection. Accordingly, Applicant submits that a *prima facie* case of anticipation for Applicant's independent claims has not been established. (The rejection set forth in the September 22, 2006 Office Action is understood to also not satisfy M.P.E.P. 2131 with regard to (at least) this recitation of Applicant's independent claims.) Thus, the rejection of Applicant's independent claims under 35 U.S.C. § 102 in the September 22, 2006 Office Action is understood to be improper.

The above remarks pertaining to the Examiner's reply to Applicant's arguments in Section B apply even to Applicant's independent claims as they stood prior to the instant Amendment. It is understood that, when the instant amendments to the independent claims are taken into consideration, *Takamura et al.* will be seen to stand even more deficient with respect to those claims. In that regard, the above remarks pertaining to the Examiner's reply to Applicant's arguments in Section A are understood to apply, *mutatis mutandis*, to the Examiner's reply to Applicant's arguments in Section B.

*The Examiner's replies to Applicant's arguments in Section C*

Regarding Applicant's arguments in Section C of the Response, the Examiner replies to Applicant's arguments pertaining to the fact that *Takamura et al.* shows merely circuit block diagrams, not diagrams showing spatial arrangements or relationships.

The Examiner states "while it is true that figure 17 of Takamura is a circuit block diagram, it does not follow that the actual circuit, along with the required wiring, would not be built in the same pattern as displayed in figure 17 of Takamura" (emphasis added). Even if, for the sake of argument, this statement of the Examiner were deemed to

be correct, it does not support a rejection of Applicant's independent claims as being anticipated by *Takamura et al.* under 35 U.S.C. § 102. The fact that a particular teaching away from an aspect of Applicant's claimed invention does not follow from a cited reference does not support a conclusion that the cited reference teaches or suggests that aspect of Applicant's claimed invention.

Further in regard to the issue of the block diagrams, the Examiner states "since the only guidance given by Takamura as to the final construction of the physical circuit is shown in the block circuit diagrams, one must take the block circuit diagrams as the shape of the physical circuit. To propose differently would be an exercise in speculation."

Applicant respectfully disagrees with these statements of the Examiner. While the block diagrams indicate the electrical or circuit connections between elements (blocks), they do not give any guidance as to other aspects of the physical/spatial construction of the circuit, e.g., the shape of the circuit, or the physical location or spatial arrangement of elements, or physical/spatial relationships between elements. The block diagram is a means to present functional or logical relationships without committing to any spatial relationships between the blocks (elements). Thus, it is not true that "one must take the block circuit diagrams as the shape of the physical circuit." The block diagram does not imply, one way or the other, that the actual spatial layout of the actual physical structure does or does not correspond to the way the structure is shown in the block diagram. Thus, to propose any spatial arrangement or relationship, based on the block diagram, would be an exercise in speculation. The Examiner implies that, to propose a spatial arrangement in accordance with the block diagram is not speculation, but to propose a spatial arrangement at variance with the block diagram is speculation. This implication is incorrect. Both such proposed

spatial arrangements, the one in agreement with the block diagram and the one not in agreement with the block diagram, are exercises in speculation. Accordingly, *Takamura et al.*'s block diagrams do not teach or suggest the relationship between the shift registers and the ink supply opening recited in Applicant's independent claims.

Also in reply to Applicant's arguments in Section C, the Examiner states "The use of a different layout on a physical circuit board would serve no substantial purpose ..." and "one of ordinary skill in the art would clearly try to keep the actual wiring and circuit construction as simple as possible ..." Even if, for the sake of argument, these statements of the Examiner were deemed to be correct, the Examiner has cited nothing in *Takamura et al.* that would teach or suggest the subject matter of these statements, such as would support a rejection of Applicant's independent claims as being anticipated by *Takamura et al.* under 35 U.S.C. § 102.

Finally, in regard to the recited plurality of shift registers provided at both longitudinal ends of an ink supply opening (in a print head assembly of a print head substrate), Applicant submits that the argument based on M.P.E.P. 2131 (that was presented above with reference to the Examiner's reply to Applicant's arguments in Section B) also applies, *mutatis mutandis*, to this recitation of Applicant's independent claims.

The above remarks pertaining to the Examiner's reply to Applicant's arguments in Section C apply even to Applicant's independent claims as they stood prior to the instant Amendment. It is understood that, when the instant amendments to the independent claims are taken into consideration, *Takamura et al.* will be seen to stand even more deficient with respect to those claims. In that regard, the above remarks pertaining to



the Examiner's reply to Applicant's arguments in Section A are understood to apply, *mutatis mutandis*, to the Examiner's reply to Applicant's arguments in Section C.

In view of the above remarks, Applicant submits that *Takamura et al.* does not teach or suggest all of the elements of any of Applicant's independent claims.

Even if, for the sake of argument, *Kawai et al.* be deemed to teach what is alleged in the Office Action, that document is not understood to remedy the above-described deficiencies of *Takamura et al.* with respect to Applicant's independent Claims.

Since the documents cited in the Office Action, whether taken singly or in combination (even assuming, for the sake of argument, that such combination were permissible), do not teach or suggest all of the elements of any of Applicant's independent claims, those claims are believed allowable over those documents.

A review of the other art of record has failed to reveal anything which, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. These claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

Favorable reconsideration and early passage to issue of the present application are respectfully requested.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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